What is claimed is:

Claim 1. An arc tube comprising:

an arc tube body including a sealed bulb serving as a discharge portion, the sealed bulb sandwiched by front and rear pinch seal portions and formed at a portion of a tube along a longitudinal direction of the tube; and

a cylindrical shroud joined with the arc tube body and covering the sealed bulb to form an airtight sealed space around the arc tube body, wherein

the arc tube body further includes circular cross- sectional portions provided at front and rear end sides of the arc tube body to which front and rear end portions of the shroud are respectively joined.

Claim 2. A method of fabricating an arc tube for a discharge lamp including:

forming shroud joining portions with circular cross sections on front and rear end sides of an arc tube body;

inserting the arc tube body into a shroud;

heating predetermined portions of the shroud wherein the predetermined portions are modified in

a direction of reducing diameters thereof as an effect of the heating; and

joining the predetermined portions to the shroud joining portions on the front and rear end sides of the arc tube body.

Claim 3. The method of fabricating an arc tube for a discharge lamp according to claim 2, wherein the joining step is performed by a welding process.

Claim 4. The method of fabricating an arc tube for a discharge lamp according to claim 3, wherein the predetermined portions include a front end side and a rear end side of the shroud, and wherein the rear end side of the shroud is welded to the rear end side of the arc tube body, and the front end side of the shroud is welded to the front end side of the arc tube body.

Claim 5. The method of fabricating an arc tube for a discharge lamp according to claim 2, wherein the shroud joining portions include a cylindrical non-pinch seal portion in an extended manner at a backward portion of a first pinch seal portion on the rear end side of the arc tube body, and a shrink

seal portion adjacent to a forward portion of a second pinch seal portion on the front end side of the arc tube body, and

the joining step includes joining a rear end side of the shroud to the cylindrical non-pinch seal portion on the rear end side of the arc tube body, and joining a front end side of the shroud to the shrink seal portion on the front end side of the arc tube body.

Claim 6. The method of fabricating an arc tube for a discharge lamp according to claim 2, wherein the shroud joining portions include a cylindrical non-pinch seal portion provided with a circular flange portion on an outer periphery thereof in an extended manner at a backward portion of a pinch seal portion on the rear end side of the arc tube body, and

the joining step includes joining the rear end side of the shroud to the circular flange portion on the rear end side of the arc tube body.

Claim 7. The method of fabricating an arc tube for a discharge lamp according to claim 5, wherein the cylindrical non-pinch seal portion includes a

circular flange portion on an outer periphery, and

the rear end side of the shroud is joined to the circular flange portion on the rear end side of the arc tube body.

Claim 8. The method of fabricating an arc tube for a discharge lamp according to claim 2, further including forming the arc tube body by:

forming a bulb at a portion of a tube;

inserting a first electrode assembly from one end side of the tube provided with the bulb;

pinch-sealing a first portion of the tube between the one end side and the bulb, and near the bulb;

supplying a predetermined filling material to the bulb;

inserting a second electrode assembly from the other end side of the tube and holding the second electrode assembly at a predetermined position,

supplying an inactive gas within the bulb;

pinch-sealing or tipping off a second portion of the tube near the other end side of the tube to seal the inactive gas within the tube; and

pinch-sealing a third portion of the tube between the other end side and the bulb, and near

the bulb.

Claim 9. The method of fabricating an arc tube for a discharge lamp according to claim 8, wherein prior to pinch-sealing of the third portion of the tube between the other end side and the bulb, and near the bulb, a seal expected area near the bulb is heated and molten to perform shrink sealing to form a shrink seal portion while cooling the bulb with a cooling medium, and thereafter, during the pinch-sealing, a bulb side of the shrink seal portion is pinch-sealed with a predetermined width, thereby forming the pinch seal portion in the third portion of the tube adjacent to the shrink seal portion.

Claim 10. The method of fabricating an arc tube for a discharge lamp according to claim 9, wherein a negative pressure is maintained within the shroud while a rear end side of the shroud is joined to the rear end side of the arc tube body by welding, a welding expected area on a front end side of the shroud is heated, molten and softened, and a front end side of the shroud is shrink-sealed to the shrink seal portion adjacent to the pinch seal

portion.

Claim 11. The method of fabricating an arc tube for a discharge lamp according to claim 2, wherein the shroud joining portions include a cylindrical non-pinch seal portion in an extended manner at a forward portion of a pinch seal portion on the front end side of the arc tube body, and

the joining step includes joining a front end side of the shroud to the cylindrical non-pinch seal portion on the front end side of the arc tube body, or to a circular cross-sectional portion of the front end side that includes the cylindrical non-pinch seal portion.